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ABSTRACT

Recent social/economic changes and technological developments are demanding reforms/renovations in the training of technical-vocational teachers in Asia-Pacific countries. Among the changes that have necessitated reform of training for technical-vocational teachers in the Asia-Pacific region are the following: population growth and rapid urbanization; poverty and lack of income-generating skills; increasing demand for secondary, technical, and female education; technological change and labor market shift; changing patterns of international trade and liberalization and globalization of the work force; pollution and environmental degradation; and new technologies of training for technical-vocational education and training (TVET). In many Asia-Pacific countries, these changes have necessitated increases in the quantity and quality of TVET teachers and development of a multidimensional approach to training TVET teachers that includes the following: preservice and continuing teacher education through formal and open learning systems; a broader-based, more flexible teacher training curriculum to replace skill-specific training programs; integration of training and education in cooperation with industries/private sectors; lifelong learning; knowledge of using new training technologies; development of multilingual and communication skills; and increased emphasis on teamwork. National, regional, and international agencies must work in partnership to strengthen/upgrade the quality and relevance of TVET teachers in Asia-Pacific countries. (Contains 13 references.) (MN)

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CHALLENGES OF CURRENT SOCIAL, ECONOMICAL AND TECHNOLOGICAL DEVELOPMENTS AND NEED FOR REFORMS/RENOVATIONS IN TRAINING OF TEACHERS IN TECHNICAL-VOCATIONAL EDUCATION

A DISCUSSION PAPER

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CHALLENGES OF CURRENT SOCIAL, ECONOMICAL AND TECHNOLOGICAL DEVELOPMENTS AND NEED FOR REFORMS/RENOVATIONS IN TRAINING OF TEACHERS IN TECHNICAL-VOCATIONAL EDUCATION:

A DISCUSSION PAPER

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INTRODUCTION

1. This document is prepared as a discussion paper in the **UNEVOC/UNESCO International Round Table on Training of Teachers/Trainers in Technical and Vocational Education (RTTTVE)**. The document draws on many published reports and articles and also reflects the views and opinions expressed by many experts and participants of the regional training programs organized by the Colombo Plan Staff College for Technician Education (CPSC), a regional inter-governmental organization of nineteen member countries in the Asia-Pacific region, established to improve the quality and relevance of technical and vocational education and training (TVET) in the CPSC member countries. However, the views expressed in this document are the views and experiences of the author only who has worked in CPSC and in TVET field in the Asia-Pacific region for the last twenty-three years.

2. The document has been organized in three parts. Part I draws attention to the challenges posed by the current social, economical and technological developments in the Asia-Pacific region in the context of global changes and challenges. Part II overviews how the countries in the region are responding to various challenges and demands, and finally, Part III looks ahead with possible international cooperation to deal with issues related to training of TVET teachers/trainers in Asia-Pacific countries.

3. In the field of teacher-training and training-of-trainers in TVET for the Asia-Pacific countries, CPSC has contributed significantly over the last twenty-three years. CPSC's regional research and training activities enabled us to identify the issues, problems and strategies which are critical for effective teacher-training in TVET. This paper is devoted to exploring the experiences related to emerging directions in training of TVET teachers and pinpointing some of the elements of success with a focus on Asia-Pacific countries. The document, however, does not claim to be comprehensive. It aims to provide a starting point for the expected discussion in the Round Table.

PART I

CHALLENGES OF CURRENT SOCIAL, ECONOMICAL AND TECHNOLOGICAL DEVELOPMENTS IN THE ASIA-PACIFIC COUNTRIES

4. In spite of great geographical, economic and demographic diversities among Asia-Pacific countries, they share many common challenges and pose many common issues which are fundamental to improve the quality and relevance of TVET to gain a competitive edge in the market economy of the 21st century. The *Asian Development Outlook 1996/97*, prepared by ADB, points out that the developing Asia, during the past decade recorded remarkable buoyant economic performance achieving an overall growth rate of 7.9 percent in 1995. There were, nevertheless, large variations and disparities in economic growth among the countries. Poverty remained one of the critical issues in many of the countries in the region. What strategic policy measure is necessary for converging the growth rate amongst the countries and eradicate poverty in the region? The Human Resource Development (HRD) theory, developed over the past decade, provides a useful direction for addressing this question. It recognizes the role of teachers/trainers and innovations in education and training for raising productivity as the ultimate engine of socio-economic growth. In order to develop a coherent strategy of training of TVET teachers, the following are some of the critical issues in the region which need to be examined in depth and their impact on recruitment and training of TVET teachers/trainers have to be assessed:

- population growth and rapid urbanization;
- poverty and lack of skills for income-generation;
- increasing demand for secondary education, technical education and female education;
- technological change and labour market shift;
- changing patterns of international trade, liberalization and globalization of the workforce;
- pollution and environmental degradation;
- new technologies of training for TVET education.

4.1 Population Growth and Urbanization

By the end of the century, the world population will number around six billion. Most of them will be in Asia-Pacific. Thirteen "Mega Cities" with more than ten million population each will grow in Asia in the next twenty-five to thirty years. The high rate of population growth added with rapid urbanization in many countries, and general improvement of communication techniques and higher level of aspirations would require in Asia new strategies of education and training for skill-development and income-generation. Technology education at all levels of education will play critical roles in this changing process.

4.2 Poverty and Lack of Skills for Income-generation in Rural Areas

Poverty remains a critical problem and continue to pose a great challenge at dawn of the 21st century. Approximately 800 million people in Asia and the Pacific live below the poverty line. The great majority of the poor live in rural areas. Many poor do not have enough skills to find productive employment. Rural poverty continues to pose one of the greatest development challenges in many Asian developing countries, particularly in countries with low per capita income. Eradication of poverty in many developing countries through various development projects cannot be optimum without carefully coordinated remedial strategies, policies and programs.

There is often a persistent bias against investment in skill-development for women who have less opportunities for education and training than do their male counterparts. Women must be brought into the mainstream of economic policy and develop skills for income-generation and self-reliance. Currently, following the Grameen Bank Model of Bangladesh, micro-credit and enterprise development is gaining grounds as a poverty-alleviation strategy, particularly for rural women.

4.3 Increasing Demand for Secondary Education, Technical Education, and Female Education

Developing economies in Asia, particularly in East Asia, are continuing to prosper leading to changing life style, education aspirations, living standards and use of modern technologies. As poverty remains one of the critical problems in some of the countries in the region, particularly in South Asia, human resource development and skill-development for improving income-generating capacities will be a key factor in the quest for improving the quality of life in the Asia-Pacific.

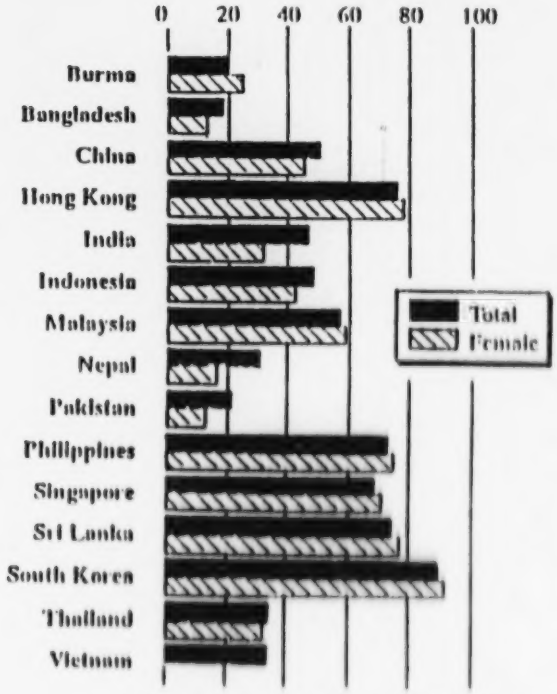
Technical-vocational education and training are areas of major interest in Asian countries, especially in those reflecting a singular economic growth like those in South-East Asia and China. Most countries in the region regard TVET as being pivotal to their development as it is intimately linked to job creation, employment provision, income-generation and life skills-training.

The growth in the enrolment in technical/vocational education, as a percentage of secondary education, is a salient feature in the countries of the region. The increase in the number of students is most apparent in countries whose economies are in transition or rapid growth, such as in South-East Asia and China (see chart).

Similarly, the percentage of female students enrolled in TVET has witnessed significant increase in some Asian countries. This trend is likely to continue in other countries of the region, if it is not visible yet. (See charts in the next two pages, 3-a, 3-b).

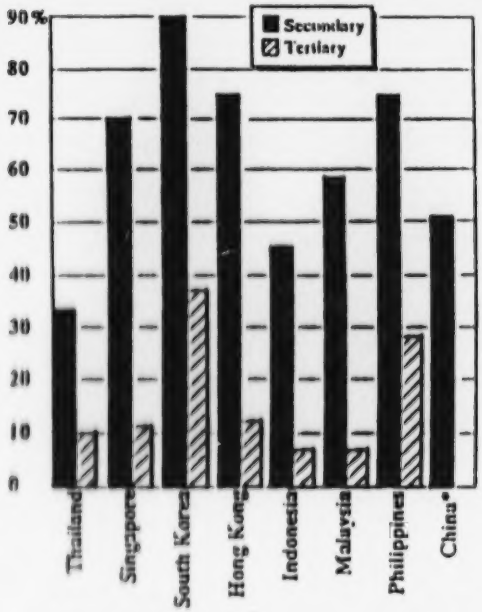
Secondary-school enrolment in Asia

% of school-age population



Note: Based on latest available estimates

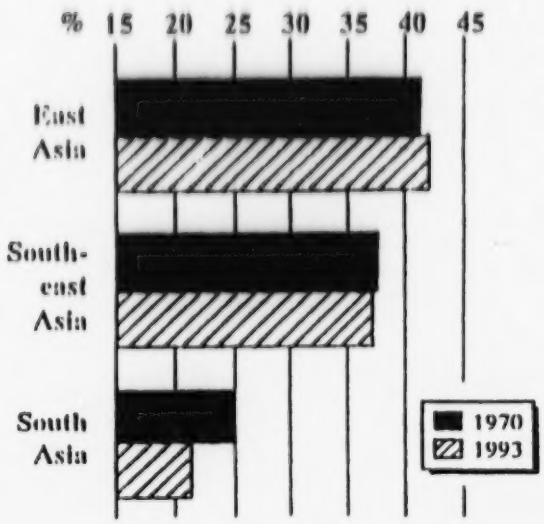
Gross enrollment ratios for selected Asian countries, expressed as a percentage of total relevant age group



Note: Statistics are the most recently available for each country *Tertiary figures not available

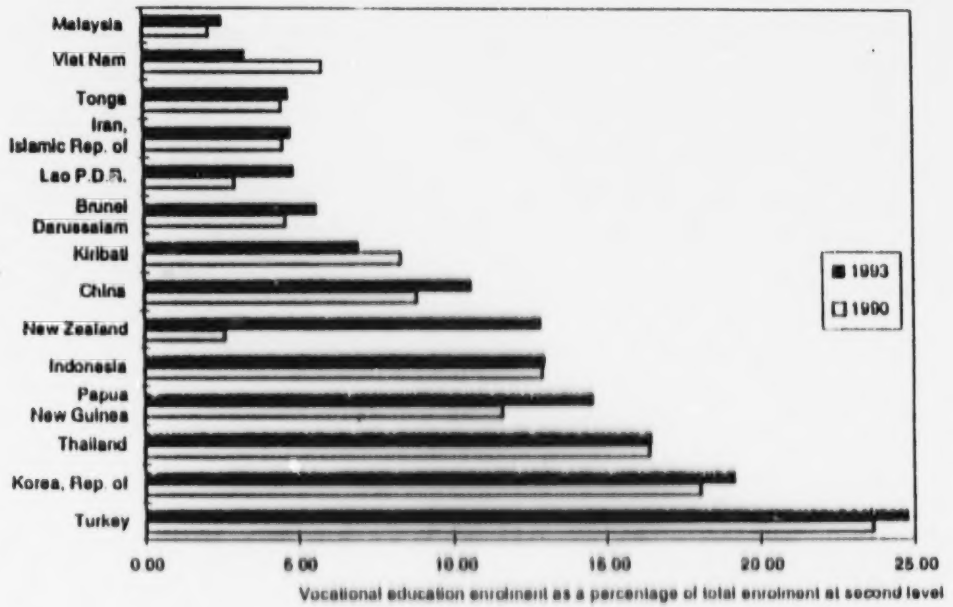
Source: World Bank and United Nations Development Program reports.

Women's share in Asia's labour force, 1970 and 1993



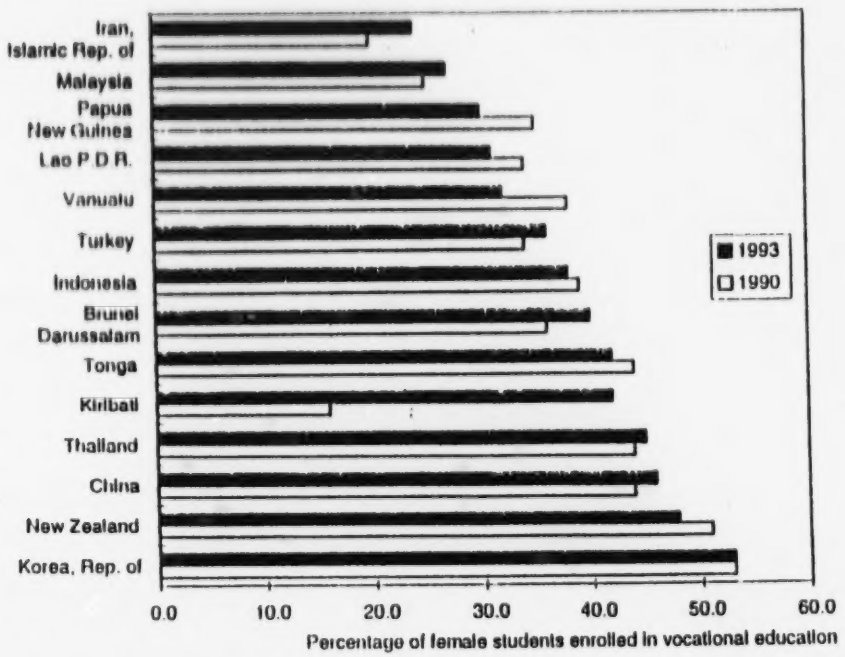
Source: International Labour Organisation

Chart Vocational Education as a Percentage of Secondary Education In Selected Countries for 1990 and 1993



Source: UNESCO, Statistical Yearbook, 1995.

Chart Female Students as a Percentage of Total Enrolment In Vocational Education for Selected Countries, in 1990 and 1993



Source: UNESCO, Statistical Yearbook 1995.

4.4 Technological Change and Labor Market Shift

Many Asian countries are fast adopting the new and emerging technologies in industry and agriculture. The new technologies, in general, need higher knowledge-base and would require knowledge-intensive application. The role of manual skills are going down. This has profound effect on employment, education and training of technical manpower, and training of teachers of TVET. One analysis (World Bank, Knight and Wasty, 1991) recognizes six main elements of technological transformation:

- the increased rate of technological innovation (especially in micro-electronics, bio-technology, and new materials);
- the cross-cutting nature of technological change (the application effect);
- shortened technology life cycles and flexibility in meeting needs;
- increased automation with a smaller role for unskilled labor;
- increased energy and material savings;
- substitution of traditional materials with new ones.

Technological development is transforming the opportunities for, and also methodologies of HRD. This raises the challenge to develop institutional and non-institutional capacities to develop and adopt strategies for continuing training and upgrading of teachers and teacher trainers in TVET. A new 'technical leadership' will be required of the TVET teachers to suit the needs of the 21st century technology. Continuing education and training of teachers will be the best investment to meet the demands of the next millennium.

4.5 Changing Patterns of International Trade, Liberalization leading to Globalization of the Workforce

International trade and investment have expanded rapidly during the past decade. Trade liberalization and structural reforms have been initiated by most of the countries in the Asia-Pacific region. Most notably, the two most populous countries in the region, India and China, are moving towards the market economy. The GATT agreement, the creation of APEC, WTO, and other organizations will further accelerate the process of globalization of trade and commerce leading to creating a global workforce. The Information Technology Agreement (ITA) in the last WTO meeting in Singapore has added a new dimension to IT. The global economic interdependence will certainly intensify further. Asia-Pacific countries with the highest rate of economic growth in the world are particularly well-placed to benefit from this process of liberalization. To remain competitive in the global workforce, high productivity and appropriate skills for that are needed by the Asian workers. Continuing professional education will become imperative with the onset of global trade liberalization.

4.6 Pollution and Environmental Degradation

Pollution and environmental degradation has phenomenally increased in Asian countries along with industrial development and population growth. Agenda 21 of the UNCED made it clear that "education is critical for promoting sustainable development". Proposals in Agenda 21 focus on re-orienting education and training at all levels, particularly of the teachers towards sustainable development. This is an urgent global need.

As ESCAP (1993) points out, five aspects of the environmental situation in the Asian and Pacific region require urgent policy intervention:

- Unsustainable human settlements environments, including inadequate or inappropriate shelter, lack of water supply, poor sanitation, poor nutrition, shortage of cooking fuel, excessive use of agro-chemicals, and increasingly concentrated habitation of environmentally fragile and hazard-prone areas.

- Pollution, including pollution of ambient air in cities and of household air in villages, pollution of lakes, rivers, underground reservoirs and marine water, toxic and nuclear waste dumping; and environmental hazards emanating from emergy-related activities.

- Degradation and destruction of natural resources, including excessive resource extraction, loss of biological diversity, deforestation, soil erosion, soil fertility loss, waterlogging, salinization and toxification of soils, damage to and destruction of coastal and marine resources, and depletion of fresh water supplies.

- Environmental calamities and natural disasters, such as floods, droughts, cyclones and storm surges, earthquakes, landslides and volcanic eruptions, which periodically affect many countries in the region, causing increasing loss of life and damage to property and infrastructure under conditions of growing population pressure.

- Global environmental problems, particularly the greenhouse effect, ozone depletion and biodiversity loss, which are intensifying the threat to already widespread environmental degradation in the region.

4.7 New Technologies of Training for TVET and Teacher-training

New technologies of training (NTT) has been introduced in many countries in the region and can go a long way to facilitate the process of curriculum development and curriculum delivery for the 21st century. Satellite communication, electronic media, computer technology, telecommunication and internet facilities are introducing a fundamental shift in the nature of education and training. In the new context, the teachers would interact very differently with students, more as guiders and mentors and less like instructors or lecturers. These new technologies and their appropriate

applications are being progressively introduced in many countries in Asia-Pacific. Countries like Singapore, Malaysia, Thailand, Philippines, India, Pakistan, etc. are already in the path of applying the NTT in educational institutions. Some of the other developing countries like Bhutan, Nepal, Myanmar, etc. have started building the necessary human and technological resources to deploy NTT in education. However, TVET do not yet make full use of these new technologies of training for upgrading its teachers.

As the Delors Report points out, nothing can entirely replace face-to-face tuition. Yet the media revolution is there and we should use it to our best advantage. New technology has created a host of new tools for use in the classroom, in laboratories, at home and on the move:

- computers of all sizes and sophistication;
- cable and satellite TV education broadcasting;
- multimedia equipment;
- interactive information exchange systems, including electronic mail and on-line access to libraries and public data bases;
- computerized simulators;
- virtual reality systems.

Using these tools, both students and teachers are equipped to become researchers. Teachers then coach their students to evaluate and use effectively the information they have gathered for themselves. This is far closer to real life situations than the older styles of teacher transmission of information to students. A new partnership between trainees and trainers is developing in the TVET classroom as well as the non-formal situations.

PART II

EMERGING TRENDS IN TVET TEACHER-TRAINING FOR THE 21ST CENTURY

5. The demands on TVET teachers' competence, professionalism, attitude, values and work ethics in the context of new and emerging technologies in the region as well as the globalization of the workforce would impose enormous responsibilities on TVET teachers in the 21st century. In many countries, quantitative expansion of TVET has put much pressure on quantity and quality of TVET teachers. Planning and implementation of reforms in TVET teacher training will require effective partnerships among: a) national planners; b) TVET institutions; c) teachers' organizations; d) media experts; and (e) international agencies. The question is how to forge that partnership?

6. Skills and competencies necessary to meet the challenges of TVET teacher training will not be achieved through the traditional forms of TVET teacher-training curriculum and delivery and its systems. A multi-dimensional approach is necessary to meet the objectives. These will include:

- pre-service and continuing teacher education through formal and open learning systems;
- more broad-based and flexible teacher-training curriculum replacing skill-specific training programs;
- integration of training and education in cooperation with industries and private sectors;
- life-long and flexible learning to enable the teachers to meet the demands of higher and varied demands of the teaching job;
- knowledge and skills of using new technologies of training and education including the computers;
- development of multi-lingual and communication skills;
- increased emphasis on development of work ethics, teamwork, human values and other non-technical competencies like leadership, time management, environmental awareness, etc.

The question is how do we integrate that multi-dimensional approach in our TVET planning?

7. The role of technical and vocational education teachers is undergoing a radical change. Teachers are no longer just dispensers of information. They are expected to be curriculum designers, student counsellors, educational and resource managers, internet operators, and vocational practitioners. Some of the countries in the region have opted measures to cope with the emerging situation. These include:

- recruitment of teachers from the world of business and industry;
- providing pre-service and in-service training with greater emphasis on practical skills training;
- establishment of closer links between institutions and industries for skill development of the TVET teachers;
- wider application of competency-based teacher education programs;

focus on attitude, values, work ethics and non-technical competencies in TVET teacher-training programs. The question is how to use ***success experiences*** for the benefit of all countries in the region.

8. Institutionalized Training of TVET Teachers

Twenty years ago most of the CPSC member countries did not have specific institutional facilities for training of TVET teachers and teacher trainers. Since the beginning of its inception, CPSC consistently advocated the need for establishing infrastructure for formal and non-formal pre-service and in-service training of TVET teachers and teacher trainers. Over the last twenty years many such institutions have come up in the region.

In Bangladesh, the Technical Teacher Training Institute (TTTC) is one of the first technical teachers training institutes in the sub-continent. India, in the 70's, established four Technical Teachers Training Institutes (TTTI's) in the four regions of the country. In 1978, the Government of Indonesia decided to establish eleven National Teacher Upgrading Centres (PPPG). Six of them were designed to fulfill the needs of technical

and vocational education. The rest of the Centres were for upgrading science/mathematics and other teachers. Similar national level technical teacher-training institutions have also been set up in Pakistan, Sri Lanka, Nepal, Malaysia. Many countries have developed facilities for TVET staff development through existing universities and technical institutions. The question is how to introduce Total Quality Improvement program for TVET teacher-training institutions.

9. Distance and Open Learning for Continuing Education of TVET Teachers

As a result of a careful review of the CPSC member country needs and priorities, distance education has been adopted as a necessary supplementary mode to meet some of the critical needs of teacher-training in the member countries. The objectives of the distance learning program will include:

- to update and upgrade a large number of serving technician teachers, teacher educators, and key personnel responsible for management and quality improvement of technical-vocational education and skills-development in the member countries in the Asia-Pacific region;
- to have convenient and continuing access to advance training which are of immediate relevance, cost-effective, and reflective of prime concerns of the developing member countries of the region;
- to contribute towards developing a cost-effective regional model for establishing distance education resource centre for technical-vocational education and skills-development;
- to promote innovations, research, and development for improvement of quality and relevance in technical-vocational education in the Asia-Pacific region ;
- to support technical cooperation among developing member countries for designing appropriate methods and materials for distance education;
- to establish a network of international and national organizations for distance education for TVET.

CPSC, in coordination with other organizations like the Commonwealth of Learning (COL), are promoting the concept of distance education for TVET teachers in the region. These coordinating efforts have to be further intensified for efficiency and economy of the programs.

10. Modularized Open Learning for Continuing Education

Considering individual constraints and job requirements of working teachers, most of the continuing education programs may be given as on-the-job programs. To accommodate variable requirements, programs should be flexible in nature. The flexibility is provided in selecting the contents, time and duration of study, place of study, strategy (method and media) for study, etc. The learner should have the flexibility in choice of course content according to job requirements. This flexibility helps to motivate the teacher to take part in the program.

Since the teacher and teacher trainers often are not located at the same place, the teaching/learning (T/L) package and the modules prepared by specialist experts are

such that the learners located at a distance away from the experts can understand the contents of the package through individualized self-study. CPSC has prepared a number of teacher-training modules consisting of self-explanatory concepts/principles and alternative examples of application of these concepts/principles.

Colombo Plan Staff College has conducted a number of flexible modular training programmes for technical teachers of TVET institutions using distance learning print modules prepared by CPSC's experts. It is observed that these programmes have been very well-received by technical teachers. These programs for the technical teachers of TVET system have considerably assisted in developing a number of teaching competencies.

PART III

LOOKING AHEAD

11. Looking ahead towards the 21st century and in the high tide of the Information Age, it is important to establish:

a) stronger linkages between technical and vocational education and the world of work;
b) stronger linkages between technical-vocational education and the general education in basic and secondary education systems;
c) greater efforts to develop income-generating skills, particularly in rural areas, for poverty alleviation;
d) greater effort to improve participation of women and other disadvantaged groups in skill-development programs;
e) continuing system of curriculum renewal in the context of rapid changes in technology and the challenges of open global market economy.

12. To meet the demands and responsibilities of the 21st century the TVET teachers also must change and re-equip themselves on a continuing basis with broad based and flexible technical competencies, attitudes, and values as required in a global marketplace. Reforms of TVET teachers/trainers will include:

a) provision of formal and non-formal methods of TVET teacher-training using contact and distance modes;
b) improving the quality of technical and vocational teachers education by placing greater emphasis on industry-oriented teacher training programs;
c) recruiting TVET teachers from the world of work and training them through pre-service/in-service programs; and
d) providing appropriate financial compensation/incentives to TVET teachers;
e) raising the public image and status of TVET and TVET teachers.

CONCLUSION

National, regional and international agencies must work together in a spirit of partnership to strengthen and upgrade the quality and relevance of technical and vocational teachers as well as the general education teachers to have relevant components of technical and vocational education in their teacher education curricula. Leadership for such international and regional partnership programs may come from UNEVOC/UNESCO. Agencies like COL, ILO, UNESCO, CPSC and other international agencies should meet to draw up regional action plans to develop and provide continuing education for upgrading and updating TVET teachers. Industries, NGO's, and teachers' organizations should be made part of this teacher renewal effort. CPSC, having a commitment and concern for the improvement of technical and vocational education in the Asia-Pacific region and with its vast network of TVET institutions in the region, is in a position to coordinate these efforts in the Asia-Pacific with other national and international agencies. For its success, a well-planned partnership program is necessary.

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